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*Reports from the 1990 Professional Seminar*

## **HEMI-SYNC® BRAIN WAVE CORRELATES TO KNOWN STATES OF CONSCIOUSNESS AS MEASURED IN CONVENTIONAL EEG STUDIES**

*by F. Holmes Atwater*

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For more than thirty years science has been studying brain waves in an attempt to understand human behavior better. Now, after twenty-five years of research with HemiSync, investigations at The Monroe Institute are beginning to reveal patterns of mind-brain activity activated by the Hemi-Sync process.

The mission of the Brainmapping Project, Mr. Atwater began, is to direct research efforts "solely to the development of methods and techniques that will aid others in the evolution and growth of human consciousness and perception. Through such studies, the Institute is able to identify states of consciousness and perception previously considered not measurable by conventional research ..." This project, now in its third year at TMI, was initiated at the 1987 Professional Seminar. [For a complete historical summary of the Brainmapping Project, see BREAKTHROUGH, WINTER 1989, Vol. VII, No. 1; HEMI-SYNC JOURNAL, FALL 1989, Vol. VII, No. 4; and HEMI-SYNC JOURNAL, SPRING 1990, Vol. VIII, No. 2] [See: *Topics/Physiology/Brain Mapping*]

Mr. Atwater first reviewed the technology employed to measure human brain-wave patterns during specific states of consciousness. "Here in the laboratory of the Institute, our Brainmapping Project uses a . . . state-of-the-art high-resolution topographic brainmapping device called the NRS-24. By providing multivariate real-time data acquisition and analysis, the NRS-24 allows us to converge rapidly and systematically on specific locations of the neocortex [the gray matter covering the surface of both cerebral hemispheres] and on Hemi-Sync frequencies which best correlate with desired state changes."

Illustrating his talk liberally with slides, Mr. Atwater explained that brain-wave electrical activity is measured in amplitude and frequency. Amplitudes from 20 to 300 microvolts, and frequency ranges (from high to low frequency) of Gamma, Beta, Alpha, Theta, and Delta, are the main

areas of interest. “Although we can measure the electrical activity of the neocortex with scalp electrodes,” he clarified, “the exact source of the brain’s electrical potentials is still debated in electroencephalogram (EEG) literature.” In spite of this controversy over EEG origins, research shows that the EEG exhibits certain regularities with fairly predictable relationships to known psychological states.

Published literature and brain-wave monitoring of sleep states at TMI agree that specific patterns are characteristic of the sleep process [see Figure 1], while research on attentional states uses the model of a continuum [see Figure 2], ranging from a “narrow focus” to an “open focus.” As with a camera lens, a narrow focus is characterized by the restriction of perception to a particular identified point of attention. It is accompanied by a predominance of high-frequency, desynchronized EEG activity. Open focus is characterized by a wide, unrestricted perception and a diffuse range of attention. Its predominant EEG activity is of lower frequency, higher amplitude, and is more synchronous. Like sleep states, attentional states can be influenced by Hemi-Sync. The Hemi-Sync Concentration tape, which stimulates highly focused, cognitive attention, typifies a narrow-focus format, while the Free Flow 10 tape demonstrates an open-focus format.

“Given the relationships between changes in states of consciousness and changes in the electrical activity of the brain,” Mr. Atwater said, “researchers have gone on to investigate particular alterations of consciousness, sometimes called ‘altered states of consciousness’, such as meditation,... and the ‘twilight state’.” Meditation research cites at least three stages, or levels, of meditation which have corresponding brain-wave activity indicating specific open-focus attentional states.

One level, often achieved by adept meditators, is characterized by a spread of high-amplitude Alpha waves from the occipital to the frontal areas of the scalp. Many of TMI’s brain-mapped subjects exhibit a similar pattern of synchronous activity when experiencing a Focus 12 state. Another level of meditation, associated with synchronous Theta waves from the frontal to occipital areas, has been seen consistently with individuals experiencing a Focus 15 state.

The deepest level, present only among advanced meditators, is characterized by high Beta and Gamma activity measured over the entire scalp. Skilled Hemi-Sync users in a Focus 21 state have demonstrated high Beta waves with synchronous activity in the lower frequencies. Hemispheric synchrony is also a consistent finding in EEG research on meditators using a variety of techniques. Hemi- Sync appears to promote the recurrence and persistence of this synchrony. “Although deep relaxation or sleep are possible with the Hemi-Sync process,” summarized Mr. Atwater, “other states [such as meditation/Focus 12, 15, and 21 experiences] appear distinct in that they invariably involve a mental device which serves to keep the individual conscious, with some degree of attentional focus.”

Mr. Atwater then discussed correlations between EEG research and Hemi-Sync influence relative to Stage I sleep (the “twilight,” or hypnagogic, state), which occurs briefly just prior to sleep. This twilight state is characterized by subjective experiences of enhanced imagery, free association, a decrease in critical judgment, and a predominance of Theta brain-wave activity. Learning, conflict resolution, and positive change are facilitated in this state. Therefore, techniques, including Hemi-Sync, have been developed to aid subjects to sustain Theta-wave production over longer periods of time. Stating that “the H-PLUS® series of tapes is designed to provide access to states of consciousness based in the Theta domain,” Mr. Atwater showed topographic brain maps of a subject listening to an H-PLUS tape. The brain map indicated the production of primarily Theta frequencies.

“Topographical brain-wave mapping has provided us with a whole new way of exploring the mind-brain interface,” he explained. Displaying a series of slides depicting specific but, as yet, enigmatic patterns, he continued, “There are numerous brain-wave patterns for which there is little or no known explanation to be found within historical scientific studies.” This is a fertile area for collection and correlation of data from disparate sources.

Two brain maps of the same subject before and after Hemi-Sync introduction completed the visual presentation. Before Hemi-Sync, the brain-wave patterns were random and asynchronous. Following Hemi-Sync, the same subject demonstrated a “wonderfully synchronous pattern” over a sustained period of time, representing a state of focused attention.

Mr. Atwater concluded with an explanation and invitation to interested researchers: “The Brainmapping Project has not been designed to conduct studies in form and protocol that will ensure acceptance by orthodox segments of our culture and we do not possess any papers or other documentation suitable for this purpose. The Institute recognized long ago that such an effort may not be possible within the area of investigation covered in our work. The question of compatibility is too great. We do, however, encourage other organizations to conduct studies that may offer additional or extended verification of our work.”

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